

AMENDMENTS TO THE CLAIMS

Listing of Claims

The following listing of claims replaces all prior versions and listings of claims in the application.

1. (Currently amended): An ignition device for internal combustion engine, containing:

- a main chamber (1) designed for including a main combustible mixture, and fitted with a compression system of said mixture,
- an igniter (11) containing a precombustion chamber (2) designed for receiving reactants and an ignition system (13,14) of the reactants contained in the precombustion chamber, said precombustion chamber (2) being defined by a precombustion chamber body (12) having a head (12a) including at least one passageway (15), said head (12a) of the precombustion chamber body separating the precombustion chamber (2) from the main chamber (1) and communicating the precombustion chamber (2) and the main chamber (1) by dint of the passageway(s) (15),

characterised in that said precombustion chamber body (12) is made of a material having a thermal conductivity at 20°C of at least 10 W/K/m.

2. (Currently amended): An ignition device according to ~~claim 1 characterised in that claim 1, wherein~~ said precombustion chamber body (12) is made of a material having a thermal conductivity at 20°C of at least 30 W/K/m, preferably of at least 50 W/K/m.

3. (Currently amended): An ignition device according to ~~any of the previous claims characterised in that claim 1, wherein~~ said precombustion chamber body (12) is made of a material having a thermal conductivity at 20 °C smaller than or equal to 350 W/K/m.

4. (Currently amended): An ignition device according to ~~any of the previous claims characterised in that claim 1, wherein~~ the material forming said precombustion chamber body (12) is selected among the copper alloys.

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5. (Currently amended): An ignition device according to ~~claim 4 characterised in that claim~~
~~4, wherein~~ the material forming the precombustion chamber body according to the invention is selected among binary brasses, copper-nickel, copper-aluminium and copper-nickel-zinc alloys.

6. (Currently amended): An ignition device according to ~~claim 5 characterised in that claim 5,~~
~~wherein~~ the material forming the precombustion chamber body according to the invention is selected among the alloys CuZn5, CuZn10, CuZn15, CuZn20, CuZn30, CuZn33, CuZn36, CuZn37, CuZn40, CuNi44Mn, CuNi5Fe, CuAl5, CuAl6, CuAl10Fe5Ni5, CuNi10Zn27, CuNi12Zn24, CuNi15Zn21, CuNi18Zn20, CuNi18Zn27, CuNi10Zn42Pb2 and CuNi18Zn19Pb1, preferably the alloy CuZn5.

7. (Currently amended): An ignition device according to ~~claim 4 characterised in that claim~~
~~4, wherein~~ the material forming said precombustion chamber body (12) is CuCr1Zr.

8. (Currently amended): An ignition device according to ~~any of the previous claims~~
~~characterised in that~~ claim 1, wherein said passageway(s) (15) are of cylindrical shape and of diameter greater than 1 mm.

9. (Currently amended): An ignition device according to ~~any of the claims 1 to 7~~
~~characterised in that~~ claim 1, wherein said passageway(s) (15) are capable of preventing the propagation of a flame front while enabling the propagation of unstable compounds derived from the combustion of the reactants contained in the precombustion chamber (2), the compression system of the main chamber (1) and the seeding of the main mixture with said unstable compounds enabling mass self-ignition of the main mixture.

10. (Currently amended): An ignition device according to ~~claim 9 characterised in that~~
~~claim 9, wherein~~ said passageway(s) (15) are of cylindrical shape and of diameter smaller than or equal to 1 mm.

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11. (Currently amended): An ignition device according to ~~claim 9 or 10 characterised in that claim 9, wherein~~ said passageway(s) (15) have a length smaller than or equal to the diameter thereof.

12. (Currently amended): An ignition device according to ~~claim 9, 10 or 11 characterised in that claim 9, wherein~~

- the upper section of the precombustion chamber body (12), not adjoining the main chamber, is in the form of a cylinder of inner diameter Φ , and
- the head of the precombustion chamber body comprises several passageways (15), said passageways being circumscribed by a circular curve of diameter d_2 running through the centres of the outermost passageways (15), the ratio d_2 / Φ being smaller than or equal to 0.5.

13. (Currently amended): An ignition device according to ~~the previous claim characterised in that claim 12, wherein~~ the ratio d_2 / Φ is smaller than or equal to 1/3.

14. (Currently amended): An ignition device according to ~~claim 12 or 13 characterised in that claim 12, wherein~~ the centre of the curve running through the centres of the outermost passageways (15) is situated on the axis symmetry (2b) of the precombustion chamber (2).

15. (Currently amended): An ignition device according to ~~claim 12 or 13 characterised in that claim 12, wherein~~ the centre of the curve running through the centres of the outermost passageways is situated at a distance d_3 from the axis symmetry (2b) of the precombustion chamber (2), said distance d_3 being equal to or greater than the quarter diameter Φ of the precombustion chamber (2).

16. (Currently amended): An igniter for internal combustion engine containing a precombustion chamber (2) defined by a precombustion chamber body (12) having a head (12a) fitted with at least one passageway (15), the precombustion chamber being designed for including a combustible mixture, and an ignition system (13,14) of the combustible mixture contained in the

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precombustion chamber (2), ~~characterised in that wherein~~ the precombustion chamber body (2) is made of a material having a thermal conductivity greater than 10 W/K/m.

17. (Currently amended): An igniter according to ~~claim 16 characterised in that claim 16,~~ wherein said precombustion chamber body (12) is made of a material having a thermal conductivity greater than 10 W/K/m, preferably greater than 30 W/K/m.

18. (Currently amended): An igniter according to ~~claim 16 or 17 characterised in that claim 16,~~ wherein said precombustion chamber body (12) is made of a material having a thermal conductivity smaller than or equal to 350 W/K/m.

19. (Currently amended): An igniter according to ~~any of the claims 16 to 18 characterised in that claim 16,~~ wherein the material forming said precombustion chamber body (12) is selected among the copper alloys.

20. (Currently amended): An igniter according to ~~claim 19 characterised in that claim 19,~~ wherein the material forming said precombustion chamber body (12) is selected among the binary brasses, copper-nickel, copper-aluminium and copper-nickel-zinc alloys.

21. (Currently amended): An igniter according to ~~claim 20 characterised in that claim 20,~~ wherein the material forming said precombustion chamber body (12) is selected among the alloys CuZn5, CuZn10, CuZn15, CuZn20, CuZn30, CuZn33, CuZn36, CuZn37, CuZn40, CuNi44Mn, CuNi5Fe, CuAl5, CuAl6, CuAl10Fe5Ni5, CuNi10Zn27, CuNi12Zn24, CuNi15Zn21, CuNi18Zn20, CuNi18Zn27, CuNi10Zn42Pb2 and CuNi18Zn19Pb1, preferably the alloy CuZn5.

22. (Currently amended): An igniter according to ~~claim 19 characterised in that claim 19,~~ wherein the material forming said precombustion chamber body (12) is the alloy CuCr1Zr.